

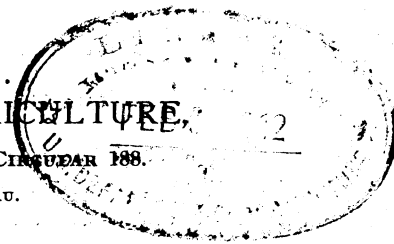
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INCREASING CREAMERY PROFITS BY HANDLING SPECIAL PRODUCTS AND UTILIZING BY-PRODUCTS.¹

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The creamery industry of this country is now developed to such an extent that in most dairy sections competition has become very keen, and creamery operators in order to be successful must use every means within their power to keep their operating expenses to a minimum and at the same time market their products to the best possible advantage.

Many creamery operators have had no special business training or experience, and very often ability along this line has not been considered essential to success, but with the close competition now existing the necessity for businesslike methods is becoming apparent. Opportunities for increasing the revenue of creameries are frequently overlooked and many wasteful practices are often permitted. Such results are partly due to the operator's lack of knowledge as to what might be accomplished, but largely because such creameries are not being pressed to the limit of their resources. However, the conditions are evidently improving, as recent reports show that many creamery managers now realize the importance of stopping the leaks often found in their operating methods and of putting their business on a more solid basis so as to better withstand the increasing competition and give their patrons better prices.

There are three methods that are being advantageously used for this purpose: First, by manufacturing some special products that will yield relatively large returns; second, by utilizing the by-products of the creamery to better advantage; and, third, by conducting some other line in connection with the creamery that will use spare power and labor and in this way reduce the operating expenses.

It is not the purpose of this article to describe in detail an outline that should be followed in all cases, nor is it intended to discuss the various subjects from a technical standpoint. It is written rather with the object of pointing out, along practical lines, opportunities for creameries to improve and increase their business that are frequently overlooked, and which if embraced would in many instances place them on a more successful basis.

¹ Reprinted from the Twenty-seventh Annual Report of the Bureau of Animal Industry (1910).

THE HANDLING OF SPECIAL PRODUCTS.

The special products most generally handled by creameries and perhaps the ones offering the best results are the sale of sweet cream and the manufacture of ice cream.

THE SALE OF SWEET CREAM.

In some sections of the country this means of disposing of a part or all of the product of the creamery has proved very satisfactory and profitable. It not only has enabled creameries to pay high prices for the sweet milk and cream delivered by their patrons, but has been a means of improving the quality of the product generally, and consequently has given a stimulus to dairying that might not have been possible otherwise. The demand for sweet cream from dealers who supply this commodity in bottles to consumers and from ice-cream manufacturers is rapidly increasing. Their supply is very often hard to get and frequently has to be shipped long distances. The prices paid creameries for this product usually range from 3 to 12 cents per pound of butterfat higher than can be obtained from its sale in the form of butter. On account of the demand for sweet cream and the prevailing high prices for the same many creameries conveniently located and having a supply of fresh, sweet material can therefore substantially increase their revenue above what would be possible if all their output was sold as butter.

The methods usually employed by creameries that ship sweet cream are as follows: The milk or cream received from the farm is carefully graded in the receiving room, and that portion intended for shipment as sweet cream is kept by itself during the entire process of preparing for market. If the whole milk is received it is at once run through separators and a cream secured having a definite amount of butterfat, which is usually guaranteed and made the basis of selling. If farm-separated cream is received which does not contain the required amount of butterfat, it is re-separated in order to bring it to the guaranteed standard. The standard frequently adopted when cream is shipped is a 40 per cent butterfat content, which gives a thick, heavy cream. This cream is carefully pasteurized, either by the "flash" or "holder" process. When the "flash" process is used the cream should be quickly heated to 165° F. or above and immediately cooled. With the "holder" process the cream should be heated to a temperature of 145° F. or more and held at that temperature from 20 to 30 minutes, either in a retarder specially designed for the purpose or in an ordinary covered vat, after which it should be quickly cooled.

Creameries have generally found the latter method more efficient, and for this reason it has been usually adopted where thorough work is necessary, although the "flash" process has been found satisfactory

when reasonably high temperatures have been maintained. With either process of pasteurizing care should be taken to have the cream cooled quickly to a temperature as close to freezing as possible if the best results are to be secured.

From the cooler the cream is put into cans, usually holding 10 gallons, and shipped to market. In shipping it is protected from heat by the use of felt jackets or by wooden cases packed with crushed ice. If it is to be sold at retail it is bottled by the retailer and delivered to customers in the bottles, but when sold to bakeries or ice-cream manufacturers it is generally kept in the shipping cans until used. In both instances the cans are returned when empty to the creamery to be refilled.

Cans used for shipping sweet cream must be perfectly clean if a fine quality of cream is to be furnished. To secure such results they should be washed and steamed immediately after the cream has been removed from them and before any portion is allowed to dry or harden on the cans or become decomposed. After the cans have reached the creamery they should be rinsed and sterilized with live steam, then aired, drained, and cooled before being again used. If this work is carefully done no contamination of the cream is likely to come from the cans.

If care is exercised in selecting the raw material, and such material is properly pasteurized and cooled, it may be shipped for considerable distances, and with reasonable care will remain in good condition for a week or more. There is but little, if any, extra expense attached to the preparation of this product, and the prices received make its sale very desirable from the creamery standpoint; neither is there any doubt that many creameries can find a satisfactory market for such a product.

MANUFACTURE OF ICE CREAM.

During the past few years many creameries have installed machinery for making ice cream and have undertaken the manufacture of this product as a side line, with satisfactory results. The enormous increase in the consumption of ice cream, together with the fact that it is now generally on sale in the small towns as well as in the large ones, has opened new fields for its manufacture, thus giving the small operator an opportunity to do a successful business in competition with the larger ones.

Creamery managers should carefully study the opportunities for marketing this product, as the market and their ability to reach it are important factors in its successful manufacture. Creameries located in comparatively small towns can often find a local market for a sufficient amount of ice cream to warrant installing the machinery necessary for its manufacture on a small scale. In such cases

the regular creamery force can do the work without extra expense. In the larger towns, or where there are opportunities for shipping large quantities, it would probably be necessary to establish a separate department with an experienced maker in charge. This, of course, would involve more capital and greater expense than is necessary in a small plant. In either event the market should be carefully considered, and if found satisfactory the business is likely to prove profitable.

Most States have laws requiring that ice cream shall contain a stated amount of butterfat known as the fat standard, and every creamery operator who contemplates engaging in the business should be familiar with these requirements and willing to meet them, for such standards aid the honest manufacturers by preventing unfair competition from the unscrupulous ones.

The creamery seems to be the logical place for manufacturing ice cream, as it has a supply of both raw cream and ice, which are the two most important factors in making this product. Therefore, with a suitable market creameries have a satisfactory combination for conducting such a business successfully. Then, again, they are in position to make just what quantity is necessary to supply the demand and use the remainder of their cream in the manufacture of butter, for which their market is already established. Consequently there is little risk of incurring the losses which sometimes happen in plants where ice-cream making is the special line.

The demand for ice cream depends to a large extent on the condition of the weather and the temperature of the atmosphere, and consequently is somewhat irregular; but in the creamery this fluctuation in the demand is less serious than where the outlet is for ice cream only. Reports from creameries making ice cream show that the prices received for this product are relatively high and that some of them are marketing a large portion of their output in this way. The average cost of making a gallon of ice cream in creameries is reported by them to be about 45 cents, and the same reports show the average wholesale selling price to be about 87 cents, leaving a margin of 42 cents per gallon.

The profits from the manufacture and sale of ice cream are clearly brought out by the following example: One hundred pounds of 18 per cent cream is equal to 12 gallons, which with a 66 per cent overrun will produce 20 gallons of ice cream, and if sold for 87 cents a gallon will amount to \$17.40. Allowing that sugar and flavoring for this amount costs \$1.40, there is left \$16 for 18 pounds of butterfat used. On this basis the butterfat sells for 88.8 cents a pound. The same amount of butterfat made into butter with a 21 per cent overrun would produce 21.78 pounds of butter, and if sold for 31 cents a pound (average price for New York extras 1910) would amount

to \$6.75, or 37.5 cents a pound of butterfat. A comparison of these items shows a difference of 51.3 cents a pound in favor of ice cream.

The special equipment necessary for the average creamery to manufacture ice cream consists of freezer, ice crusher, holding cans, and hardening vat, and need not exceed \$300 in cost. Such an outlay will often be paid for in one season and a substantial surplus remain from the profits of this branch of the business.

THE UTILIZATION OF BY-PRODUCTS.

But little attention has been paid to the methods of disposing of by-products in many creameries. So long as the buttermilk and skim milk have not accumulated so as to decay and cause offensive odors, operators have been content with little or no revenue therefrom. It has been the custom in many places to sell the buttermilk for a nominal price or even to give it away if removed sufficiently often to prevent it becoming a nuisance and causing contamination of the other creamery products. Occasionally large quantities have been regularly run into the sewer. Such methods are not only wasteful but needless, as there are several ways in which both skim milk and buttermilk may be utilized to bring large returns.

The methods of utilizing both skim milk and buttermilk most general and perhaps easiest to accomplish are feeding hogs at the creamery and manufacturing casein. There are, however, several varieties of soft cheese that may be made from skim milk, such as cottage, pot, or bakers'. These cheeses usually bring good prices, but as a rule are in limited demand; a few creameries, however, have been able to develop a market for all their skim milk in this way. Some creameries are also manufacturing cheese from buttermilk, but this being a comparatively new product, although a desirable one, is not yet in great demand.

FEEDING BUTTERMILK TO HOGS.

The value of buttermilk as a food for hogs has long been known to practical feeders and investigators, but notwithstanding this fact it has often been wasted in large quantities at creameries or has been sold by them for prices much below its value as a hog feed. With the growing interest in business methods has come a realization that such wasteful methods are unnecessary; consequently some creameries in various parts of the country are feeding their buttermilk to hogs and report good results. The value of buttermilk for this purpose depends largely on the price of pork, so that the present high prices give the buttermilk a relatively high value as a hog feed.

SOME EXAMPLES OF PROFITABLE FEEDING.

On account of the limited experimental data available on this subject it is impossible to place a definite value upon buttermilk as a feed for hogs. The following, however, are some of the results reported by creameries in different States; and while the accuracy of these results can not be vouched for by the bureau, they show what has been done in a practical way by some creameries and indicate that under some circumstances creameries may find it profitable to feed buttermilk to hogs:

A creamery in California reports feeding 86 hogs on buttermilk and middlings, from which it realized an average net profit of \$10.75 per hog for season.

A creamery in Iowa fed 308 hogs on buttermilk, corn, and pasture, and reports an average profit of \$5.38 per hog.

A Kansas creamery reports feeding 78 hogs on buttermilk and corn, with an average profit of \$2.59.

In Oklahoma one creamery fed buttermilk and shorts to 170 hogs and reports a net profit of \$7.32 per head.

A Pennsylvania creamery reports feeding buttermilk, middlings, and shorts to 30 hogs, with an average profit of \$6.66 per head.

A Washington creamery fed 69 hogs on buttermilk, shorts, and bran, with a profit of \$5.26 per head.

These results, which are taken from the reports furnished by the creameries, show an average profit of \$6.32 per hog. This amount includes the cost of labor in caring for the hogs and the value of the buttermilk fed for the season. It is, however, doubtful if there is any extra expense to the creamery for labor, as this work is usually done by the regular force and probably all the profit can be allowed on the value of the buttermilk fed.

The following table, made from the report of an Iowa creamery, shows the results obtained from feeding 12 hogs for 42 days and selling them on an 8-cent market:

Results of feeding 12 hogs for 42 days on buttermilk and corn.

	Price of hogs.	Weight of hogs.	Date.	Value of corn.	Profits from buttermilk.
		<i>Pounds.</i>			
Bought.....	\$156.00	2, 140	Oct. 27, 1910	} \$28.00	\$43.20
Sold.....	227.20	2, 840	Dec. 7, 1910		

The value of the buttermilk fed amounted to approximately \$1 per day for the 12 hogs, or 8.33 cents each, and the average daily gain per hog was 1.38 pounds.

The following extract from the report of a Michigan creamery shows some practical results from feeding buttermilk to hogs:

Recently we turned off 11 pigs that were farrowed the 4th day of April, making their ages a few days over 5 months. Their combined weight (dressed) was 1,680 pounds. They were taken from the sow at 5 weeks old and in the meantime had become accustomed to and learned to drink buttermilk, so they lost no weight in getting started. They were given all the milk they would clean up, with no grain ration whatever, until they were about 2 months old. For the next 2 months they were fed a small ration of soaked corn once a day with the buttermilk. The amount was somewhat increased after that until turned off. Total and only kind of grain fed was 9 bushels of corn, soaked until it began to get sour or ferment.

Assuming the price of dressed pork to be 10 cents a pound, the receipts from the 11 pigs amounted to \$168. After deducting for the nine bushels of corn at 65 cents a bushel, there is left \$162.15, or a profit of \$14.74 on each hog, no allowance being made for the value of the pigs at the time of weaning.

VARIOUS METHODS OF FEEDING IN VOGUE.

The methods of feeding and raising hogs at creameries vary considerably according to the location, the size of the creamery, and the interest taken in such work. Some operators desire to raise all the pigs they fatten, and before weaning time teach them to drink buttermilk that there may be no break in their thriftiness. This method also gives the pigs a larger capacity for assimilating this feed. Reports from creameries indicate that hogs having run on pasture until they weigh 150 pounds or more learn to drink buttermilk slowly, so they must be started carefully or there may be considerable loss; also that practically all creameries feed several times a day, from three to eight, beginning with small amounts, then increasing as the hogs become accustomed to the feed. They also report that sanitary conditions must be given careful attention and that the milk tank should be emptied and cleaned daily; the troughs and pens should be kept clean, and cinders or other substances should be used to prevent the pen from giving off bad odors and becoming too wet and soft. Plenty of good water, shade for summer, plank or cement feeding floor, and good bedding are to be found in the pens of most successful feeders.

Some feeders caution against the feeding of cold or stale buttermilk, stating that it causes constipation and piles and that it weakens the kidneys. Others report that skim milk when just turning sour causes bloating. Another precaution that should always be taken is to have all the skim milk and buttermilk intended for feeding purposes thoroughly pasteurized to prevent spreading the germs of tuberculosis. Where milk from several herds of cows is received at a creamery and the skim milk and buttermilk from the same is

stored in a common receptacle the possibilities of it containing the germs of tuberculosis are very great. It has been demonstrated that hogs are very susceptible to this disease and that its prevalence among them is often due to the supply of milk. For these reasons the supply should always be pasteurized to prevent infection. Pens should be located at a sufficient distance from the creamery so that there will be no possibility of the odors reaching it to contaminate the products at any stage or process of manufacture. Unless both these precautions are taken it will be better to dispose of the by-products in some other way.

The advisability of feeding buttermilk to hogs depends entirely on local conditions at each creamery. There are several things to be considered in this connection, but where other means of disposal fail to give reasonable returns for the buttermilk and the creamery has sufficient and proper space for pens and the necessary means for properly feeding and caring for hogs, hog feeding should be a reasonably safe and sure method of disposing of by-products at a very satisfactory profit.

MANUFACTURE OF DRIED CASEIN.

Casein may be made from either skim milk or buttermilk, but the quality of casein from skim milk is superior to that made from buttermilk and consequently brings a much higher price. At the present time the price of dried casein from skim milk is relatively high, ranging from 8 to 10 cents a pound, and skim milk of average quality will yield from 3 to 3½ per cent. At this price and yield skim milk would be worth from 25 to 30 cents per 100 pounds when made into this product. The manufacture of dried casein requires special machinery, such as vats, presses, grinding mills, heating coils, and drying chambers, and experienced operators are usually necessary to get best results. The special machinery and extra floor space required may prevent the small creamery from attempting its manufacture, but those creameries which handle large quantities of milk and have the required space may find it to their advantage to do so.

The process may be briefly stated as follows: The skim milk is run into a wooden vat, where it is heated to about 120° F. by steam being run directly into the milk. After the milk has reached this temperature commercial sulphuric acid is usually added to coagulate it. The acid and milk are thoroughly mixed by stirring. After the curd begins to form it is stirred gently until the whey becomes clear and the separation is complete. The whey is then drawn off and the curd allowed to remain in the vat and thoroughly drain. The curd is then inclosed in a heavy press cloth and put into a press in layers. The style of press used is similar to the old-style cider press, in which the curd remains until the next day, when it is broken up and run

through the grinder, which grinds the chunks of curd into grains about the size of wheat. This fine curd is then spread on wire-cloth trays in very thin layers. Several trays are placed on a truck, one above the other, and wheeled into a drying chamber, where they remain for about 24 hours. The chamber is usually a tightly made box through which air heated by passing over steam coils is forced by a fan. The dried casein, after being removed from the drying chamber, is reground in a mill specially devised for the purpose and is then put into clean sacks holding from 100 to 125 pounds each, when it is ready for shipment to market.

Dried casein is used in the manufacture of certain kinds of cold-water paints, but the greatest demand comes from paper manufacturers, who use it in large quantities for paper sizing. The prices paid have steadily increased during the past few years and the demand has been good, thus affording a market for the entire output of a creamery at fair prices.

HANDLING EGGS THROUGH THE CREAMERY.¹

There are several other lines that might be enumerated, but handling eggs and manufacturing ice seem to be the most satisfactory in connection with a creamery.

Handling eggs has been found an ideal side line for the creamery when properly regulated. The teams that bring milk and cream to the creamery can also bring eggs produced by patrons, with practically no extra expense. In this way the creamery can secure the eggs at frequent intervals and under such restrictions as will insure their being absolutely fresh and of finest quality. It can also cool the eggs if necessary and market them in a manner that will secure a premium above the quoted prices for the finest grades. Statistics show that under ordinary conditions of marketing there is a great loss on account of poor eggs. There is also much dissatisfaction from the consumer for the same reason, but where the producer is made responsible for the quality and the creamery, with its facilities for handling them properly, is made the central market the consumer finally gets a grade of eggs for which he is willing to pay a high price.

The plan that has proved most successful is for the creamery to deliver egg cartons and a private stamp to each patron. The eggs are stamped, placed in the cartons, sealed as soon as gathered, and kept cool until delivered.

In securing a market for guaranteed fresh eggs through a creamery, patrons are usually pledged to comply with certain rules, and in case

¹ This subject is more fully discussed in an article in the Twenty-sixth Annual Report of this bureau, entitled "Marketing Eggs Through the Creamery," by Rob R. Slocum. This article has also been published as Farmers' Bulletin 445.

of failure to do so they are forbidden the privileges of the market. They usually agree to deliver eggs that are not over a specified number of days old and to gather them twice daily; to grade the eggs to secure uniform size; to keep white and brown eggs separate; to keep eggs clean and to store them in a cool, dry place; to stamp each egg and the carton in which they are placed; and not to sell eggs stamped with the creamery stamp to any other parties.

Prices received for eggs produced and marketed in this way usually range from 2 to 5 cents a dozen over the ruling price, and in some instances where special markets have been developed even greater premiums are secured. Doubtless many creameries can in this way improve their condition and secure closer cooperation with their patrons with little if any added expense.

MANUFACTURE OF ICE.

Proper refrigeration is of the greatest importance to every creamery, and in sections where natural ice is not produced it is a serious item of expense. A creamery that does not have facilities for properly controlling temperatures can not expect to make butter of satisfactory quality, therefore creameries without a natural ice supply must either buy ice or manufacture it. In most instances they can better afford to operate their own ice plant than to buy from others, and in this way make the manufacture of ice a practical side line. Refrigerating machinery is expensive, but when necessary in a creamery the manufacture and sale of ice will often result in using spare power and labor profitably.

Creamery operators will usually find one or more of the side lines described a desirable undertaking if satisfactory markets are obtained and reasonable care is exercised in manufacturing the products.

Quality is the most essential factor in the successful operation of a creamery, whether the product made be butter alone or in connection with one or more side lines. Relatively high prices can always be secured for butter and other creamery products of the finest quality, and when good quality and businesslike methods are combined a successful creamery is assured.

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